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RESEARCH ARTICLE

Efficacy of *Aloe vera*/olive oil cream versus betamethasone cream for chronic skin lesions following sulfur mustard exposure: a randomized double-blind clinical trial

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Abstract

Background: Chronic pruritic skin lesions are among the common late complications of sulfur mustard intoxication. In the present randomized double-blind clinical trial, therapeutic efficacy of *Aloe vera*/olive oil combination cream in the alleviation of these lesions was evaluated and compared to that of betamethasone 0.1% cream.

Methods: Sixty-seven Iranian chemical warfare-injured veterans were randomized to apply *A. vera*/olive oil ($n = 34$, completers = 31) or betamethasone 0.1% ($n = 33$, completers = 32) cream twice daily for 6 weeks. Evaluation of pruritus severity was performed using a pruritic score questionnaire and visual analogue scale (VAS).

Results: Both treatments were associated with significant reductions in the frequency of pruritus ($p < 0.05$), burning sensation ($p < 0.01$ and $p < 0.001$ in *A. vera*/olive oil and betamethasone group, respectively), scaling ($p < 0.01$ and $p < 0.05$) and dry skin ($p < 0.001$) at the end of trial. Fissure and excoriation were only reduced in the *A. vera* group ($p < 0.05$). The change in the frequency of hyper- and hypopigmentation lesions, blisters, erythema and lichenification did not reach statistical significance in any of the groups ($p > 0.05$). Mean pruritus ($p < 0.05$) and VAS scores ($p < 0.01$ and $p < 0.05$) were significantly decreased by the end of trial in both groups. The rate of improvement in the pruritus severity [defined as being classified in a less severe category (mild, moderate and severe)] was found to be comparable between the groups ($p > 0.05$).

Conclusion: *A. vera*/olive oil cream was at least as effective as betamethasone 0.1% in the treatment of sulfur mustard-induced chronic skin complications and might serve as a promising therapeutic option for the alleviation of symptoms in mustard gas-exposed patients.

Keywords: *Aloe vera*, olive oil, betamethasone, sulfur mustard, pruritus

Introduction

Sulfur mustard [SM; bis (2-chloroethyl) sulfide] is regarded as the most widely used chemical warfare agent during the past century. This alkylating agent causes potent vesicant and blistering damages to different body organs. Skin, eyes and respiratory tract are probably the most sensitive organs (1,2). Historically, SM was first used as a chemical warfare agent in World War I. Its last military use goes back to the Iraq-Iran war (1980–1988). It is estimated that over 100,000 Iranian military veterans and civilians were chemically injured by SM during this war, and many of them are still suffering from the long-term complications of SM (3–5).

Skin is among the first organs to be exposed to SM and because of its high surface area, undergoes the most damage (6). Upon exposure to SM, skin can absorb

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